

ABSTRACT

The present invention is a gas separation method using a plurality of adsorption columns packed with an adsorbent. A cycle including a series of steps (adsorption, first pressure reduction, second pressure reduction, desorption, scrubbing, and repressurization) is repeated in each adsorption column. In the adsorption step, a gas mixture (G1) is introduced into a column (A) so as to cause the adsorbent to adsorb unnecessary components, and a product gas (G2) is led outside of the column (Fig. 3A). In the first pressure reduction step, the internal pressure of the column (A) is reduced by lead-out of a gas (G3) (Fig. 4A). In the second pressure reduction step, the internal pressure of the column (A) is further reduced by lead-out of the gas (Fig. 4B). In the desorption step, the unnecessary components are desorbed from the adsorbent and purged from the column (A) (Fig. 4C). In the scrubbing step, introduction of the gas (G3) and purging of the gas (G4) are performed simultaneously (Fig. 5A). In the repressurizing step, the internal pressure of the column (A) is raised by introducing the gas (G3) (Fig. 5B). The gas (G3) that is led out from the column (A) during the first pressure reduction step is introduced into the column (C) during the scrubbing step (Fig. 4A), and the gas (G3) that is led out from the column (A) during the second pressure reduction step is introduced into the column (C) during the repressurizing step (Fig. 4B).